



Amendments to the claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1-4. (Canceled)

5. (Currently Amended) ~~An RF module according to claim 1,~~ An RF module comprising:

a first waveguide having a ground electrode, a dielectric substrate, and a line pattern of a conductor provided on the dielectric substrate, for propagating electromagnetic waves in a TEM mode; and

a second waveguide connected to the first waveguide, for propagating electromagnetic waves in another mode different from the TEM mode,

wherein the second waveguide has a region surrounded by at least two ground electrodes facing each other and conductors for bringing the at least two ground electrodes into conduction, wherein the electromagnetic waves in said another mode propagate in the region,

the first waveguide extends in a direction orthogonal to a stacking direction of the ground electrodes of the second waveguide, an end of the line pattern of the conductor is directly connected so as to be conductive to one of the ground electrodes of the second waveguide from the direction orthogonal to the stacking direction, and

magnetic fields of the first and second waveguides are coupled in an E plane of the second waveguide so that the direction of the magnetic field of the electromagnetic waves propagated in the first waveguide and the direction of the magnetic field of the electromagnetic waves in said another mode propagated in the second waveguide match with each other,

_____ wherein a plurality of penetrating conductors penetrating the dielectric substrate are provided around the line pattern so as to sandwich the line pattern between the plurality of penetrating conductors and

an interval between the plurality of penetrating conductors sandwiching the line pattern in the width direction is equal to or less than a cut-off frequency of the electromagnetic waves propagating through the first waveguide.

6. (Canceled)

7. (Previously Presented) An RF module comprising:

a first waveguide having a ground electrode and a line pattern of a conductor for propagating electromagnetic waves in a TEM mode; and

a second waveguide connected to the first waveguide, for propagating electromagnetic waves in another mode different from the TEM mode,

wherein the second waveguide has a region surrounded by at least two ground electrodes facing each other and conductors for bringing the at least two ground electrodes into conduction, wherein the electromagnetic waves in said another mode propagate in the region,

the first waveguide extends in a direction orthogonal to a stacking direction of the ground electrodes of the second waveguide, an end of the line pattern of the conductor is directly connected so as to be conductive to one of the ground electrodes of the second waveguide from the direction orthogonal to the stacking direction,

magnetic fields of the first and second waveguides are coupled in an E plane of the second waveguide so that the direction of the magnetic field of the electromagnetic waves propagated in the first waveguide and the direction of the magnetic field of the electromagnetic waves in said another mode propagated in the second waveguide match with each other, and

a penetrating conductor for coupling adjustment is provided in a coupling portion between the first and second waveguides.

8. (Previously Presented) An RF module comprising:

a first waveguide having a ground electrode and a line pattern of a conductor for propagating electromagnetic waves in a TEM mode; and

a second waveguide connected to the first waveguide, for propagating electromagnetic waves in another mode different from the TEM mode,

wherein the second waveguide has a region surrounded by at least two ground electrodes facing each other and conductors for bringing the at least two ground electrodes into conduction, wherein the electromagnetic waves in said another mode propagate in the region,

the first waveguide is positioned between the ground electrodes facing each other in the second waveguide and extends in a direction orthogonal to a stacking direction of the ground electrodes of the second waveguide, an end of the line pattern of the conductor is directly connected so as to be conductive to one of the ground electrodes of the second waveguide from the direction orthogonal to the stacking direction,

magnetic fields of the first and second waveguides are coupled in an E plane of the second waveguide so that the direction of the magnetic field of the electromagnetic waves propagated in the first waveguide and the direction of the magnetic field of the electromagnetic waves in said another mode propagated in the second waveguide match with each other, and

a window is provided in at least one of a ground electrode side to which the first waveguide is conductively connected and the side opposite to the ground electrode side in the coupling portion of the first waveguide.

9-14. (Canceled)

15. (Previously Presented) An RF module according to claim 7, wherein the second waveguide is to propagate electromagnetic waves in a TE mode.
16. (Previously Presented) An RF module according to claim 8, wherein the second waveguide is to propagate electromagnetic waves in a TE mode.
17. (Previously Presented) An RF module according to claim 7, wherein the first waveguide is a stripline, a microstripline, or a coplanar line.
18. (Previously Presented) An RF module according to claim 8, wherein the first waveguide is a stripline, a microstripline, or a coplanar line.
19. (Previously Presented) An RF module according to claim 7, wherein the second waveguide is to propagate electromagnetic waves in another mode in a multiple mode.
20. (Previously Presented) An RF module according to claim 8, wherein the second waveguide is to propagate electromagnetic waves in another mode in a multiple mode.